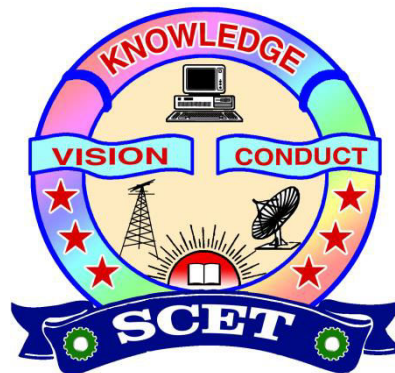


**ACADEMIC REGULATIONS
&
COURSE STRUCTURE
CIVIL ENGINEERING**

**B.TECH. FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2014-15)**



**SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY
Seetharampuram, Narsapur – 534 280, W.G.Dt.
Andhra Pradesh**

1. **INTRODUCTION**

Academic Programmes of the institute are governed by rules and regulations approved by the Academic Council, which is the highest Academic body of the Institute. These academic rules and regulations are applicable to the students admitted during the academic year 2014-15 into first year of four year undergraduate programme offered by the college leading to Bachelor of Technology (B.Tech) degree in the disciplines viz., Computer Science and Engineering, Electronics and Communication Engineering, Electrical and Electronics Engineering, Information Technology, Mechanical Engineering & Civil Engineering.

- **EXTENT:** All the rules and regulations, specified herein after will be read as a whole for the purpose of interpretation and when a doubt arises, the interpretation of the Chairman, Academic Council, Swarnandhra College of Engineering & Technology (Autonomous) is the final. As per the requirements of the Statutory Bodies, Principal, Swarnandhra College of Engineering & Technology (Autonomous), will be the Chairman of the College Academic Council.

2. **ADMISSIONS:**

2.1. **Admission into first year of any Four Year B.Tech Programmes of study in Engineering:**

Admissions into first year of B.Tech Programme of Swarnandhra College of Engineering & Technology (**Subsequently referred to as SCET**) will be as per the norms stipulated by Jawaharlal Nehru Technological University Kakinada & Govt. of Andhra Pradesh. Admissions in each programme in the Institution are classified into **CATEGORY - A** (70% of intake) through convener, EAMCET and **CATEGORY - B** (30% of intake) filled by the college management.

2.2. **Admission into the Second year (Lateral Entry) of any Four year B.Tech Programme of study in Engineering:** The candidates should have passed the qualifying exam. (B.Sc. graduation & Diploma holders) for admission into the 3rd semester directly, based on the rank secured by the candidate at Engineering Common Entrance Test [ECET for (FDH)] in accordance with the instructions received from the Convener, ECET and Government of Andhra Pradesh.

The candidate has to satisfy the other eligibility requirements stipulated by the JNT University Kakinada and / or the Government of Andhra Pradesh from time to time.

2.3. **Admissions with advance standing:** These may arise in the following cases:

- a) When a student seeks transfer from other colleges to SCET and disireous to pursue the study at SCET in an eligible branch of study.
- b) When students of SCET get transferred from one regulation to another regulation or from previous syllabus to revised syllabus.
- c) When a student after long discontinuity rejoins the college to complete his/her Programme of study for the award of degree.
- d) When a student is not able to pursue his/her existing Programme of study but wishes to

get transferred to another Programme of study.

These admissions may be permitted by the Academic Council of SCET as per the norms stipulated by the statutory bodies and Govt. of Andhra Pradesh. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained and the Programme of study at SCET will be governed by the transitory regulations.

3. **PROGRAMMES OFFERED (UNDER GRADUATE)**

Presently, the college is offering Under Graduate Programmes in the following disciplines:

- Computer Science and Engineering (CSE)
- Electronics and communication Engineering (ECE)
- Electrical and Electronics Engineering (EEE)
- Information Technology (IT)
- Mechanical Engineering (ME)
- Civil Engineering (CE)

3.1 Structure of the Programme:

Each Programme of a Discipline or branch of study will consist of:

- i). General core courses in Basic Sciences, Engineering & Technology, Humanities, Mathematics and Management.
- ii). Interdisciplinary courses in Engineering, to impart the fundamentals of Engineering.
- iii). Compulsory core courses to impart broad based knowledge needed in the concerned branch of study.
- iv). Elective courses from either the discipline or interdisciplinary areas / industry related opted by the student based on his/her interest in specialization.
- v). Seminars, Technical Paper, Comprehensive Viva-Voce, Mini Project and Major Project approved by the Department to be submitted in the course of study.

Each Programme of study will be designed to have 40-45 theory courses and 16-18 laboratory courses. The distribution and types of courses offered from the above is indicated in the following table.

General Core courses	25-30%
Interdisciplinary courses in engineering	15-20%
Compulsory Core courses in the branch of study	45-50%
Elective Courses	5-10%

Note: All components prescribed in the curriculum of any Programme of study will be conducted and evaluated.

Contact hours: Depending on the complexity and volume of the course the number of contact hours per week will be determined (4 to 6 hours per week per course).

Credits: Credits are assigned to each course as per norms mentioned in the following table.

Subject	Credits
Theory Course	03
Laboratory Course	02
Seminar/ Technical Paper	02
Soft Skills / Aptitude Lab	01
Comprehensive Viva	02
Mini Project	02
Major Project	06

3.2 Curriculum for each Programme of study:

- The Four year curriculum of any B.Tech Programme of study in any branch of Engineering is formulated based on the guidelines mentioned in 3.1 and will be recommended by the concerned Board of Studies and is approved by the Academic council of the college.
- In case of students admitted under lateral entry, the respective regular curriculum contents from 3rd semester onwards are to be pursued by them.
- In case of students admitted under advanced standing, the Programme of curriculum will be prepared by the concerned Board of Studies and the Academic Council has to approve the same.
- After approval from the Academic Council, Programme of curriculum for the same will be prepared and made available to all the students along with the academic regulations.

3.3 Maximum duration of study and cancellation of admission:

Maximum duration permitted for any student to successfully complete the four year B.Tech. Programme of study will be:

- Eight academic years in sequence from the year of admission for a normal student admitted into first year of any Programme.
- Six academic years in sequence from the year of admission for a Lateral entry student admitted into second year of any Programme.
- For students admitted with advanced standing, the maximum time for completion of Programme of study, will be twice the period in terms of academic years in sequence, stipulated in the Programme curriculum defined at the time of admission.

In case, any student fails to meet the above applicable/eligible conditions for the award of degree, his/her admission stands cancelled.

4. DURATION OF THE PROGRAMME AND MEDIUM OF INSTRUCTION: The duration of the B.Tech. Programme is four academic years consisting of eight semesters. The medium of instruction and examinations is in English. Students, who fail to fulfill all the academic requirements for the award of

the degree within minimum of eight academic years, will forfeit their admission in B.Tech course.

5. MINIMUM INSTRUCTION DAYS: Each semester will consist of 22 weeks duration with minimum of 110 working days which includes instruction, Mid examinations and Final examinations. The no. of contact periods per week are 42 to 48.

6. TRANSITORY REGULATIONS:

For students admitted under advance standing, these transitory regulations will provide the modus of operandi. At the time of such admission, based on the Programme pursued (case by case)

- Equivalent courses completed by the student are established by the BOS of concerned discipline.
- Marks/Credits are transferred for all such equivalent courses and treated as successfully completed in the Programme of study prescribed by SCET.
- A Programme chart of residual courses not completed will be derived and a Programme of study with duration specified will be prescribed for pursuit at SCET.
- Marks obtained in the previous system, as the case maybe, are converted to grades and CGPA is calculated.

All other modalities and regulations governing will be the same as those applicable to the stream of students with whom, such a candidate is merged with current regulations.

7. DISTRIBUTION AND WEIGHTAGE OF MARKS:

- (i) In each semester the course of study consists of 5/6 theory subjects + 2/3 laboratories. However, in the 8th semester there will be only 3 theory subjects in addition to the major project work and comprehensive viva-voce.
- (ii) The performance of a student in each semester will be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition Seminars, Technical Paper and Mini Project are also evaluated. Mini Project, Technical paper and Seminar are for 50 marks. Main Project during 8th Semester is for 200 marks.
- (iii) **Seminar/Technical Paper:** The Seminar/Technical paper has two components of study one from the topics of current study (course work) and the other component is suggested by the staff advisor, like reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on Seminar/Technical paper topic in the form of a report is to be submitted for evaluation along with presentation. The two components of the Seminar/Technical paper are evaluated for 50 marks each in the semester. The average of the two components shall be taken as the final score. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

- (iv) **Mini Project:** The mini project shall be carried out during the summer vacation for a

minimum of 4 weeks after the 6th semester and is to be completed before the start of the 7th Semester. A report has to be submitted at the beginning of the 7th semester for assessment by an internal evaluation committee comprising Head of the Department and two faculty of the department including the project Supervisor for 50 Marks. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

- (v) For each theory subject the distribution will be 30 marks for internal evaluation and 70 marks for the end semester examination. The internal evaluation of 30 marks consists of descriptive test for 20 marks and objective test for 10 marks.
- (vi) As part of internal assessment for each theory subject there will be 3 cycles of examinations. Each cycle consists of one descriptive test and one objective test which will be conducted after completion of two units of syllabus. **Weighted average of three cycle's** performance will be considered for award of internal assessment. A weight age of 50% for the first best cycle performance, 35% for second best cycle performance and remaining 15% for the third cycle performance are given for internal evaluation.
- (vii) The **descriptive** examination consists of 4 questions and three questions need to be answered in 90 minutes. The **objective** examination consists of 20 multiple choice questions and all are to be answered in 20 min of duration.
- (viii) The **end semester** examination will be conducted for 70 marks covering the total syllabus of concerned subjects. In end semester examination pattern, Part – A consists of a compulsory question from all units (Brainstorming/Thought provoking/Case study) for 22 marks. Part – B has 6 questions (one question from each unit) of which **three** questions are to be answered and valued for 48 marks.
- (ix) End practical examination will be conducted for 50 marks by the teacher concerned and external examiner. For practical subjects there will be continuous assessment during the semester for 25 internal marks with 15 marks for day-to-day work, including record valuation and 10 marks for two internal tests (80% for first best, 20% for second).
- (x) For the subjects of design and / or drawing (such as Engineering Drawing , Machine Drawing etc.) and estimation, the distribution will be for 30 marks as internal evaluation with 10 marks for day-to-day work, 20 marks for three Internal tests (50% for first best, 35% for second best and 15% for third). End examination will be conducted for 70 marks.
- (xi) **Main Project:** The project work to be carried out by the students during 8th semester is evaluated for Internal assessment and External Examination.
 - a) **Internal Assessment:** Internal Assessment will be carried out by Project internal assessment committee consisting of 1) Head of the Department 2) Supervisor and 3) Senior faculty member appointed by the Principal.
 - b) **External Examination:** External Examination will be conducted by Project external examination committee consisting of 1) Head of the Department 2) Supervisor and 3) External Examiner selected from the panel of Examiners.

- (xii) Total marks awarded for Project work is 200, of which 60 marks are for Internal Evaluation and 140 marks for External examination through presentation / viva - voice by / of each student. The internal evaluation will be on the basis of two seminars on the topic of the project.
- (xiii) The comprehensive viva, evaluated for 50 marks during 8th Semester. The comprehensive viva will be conducted/ evaluated on the topics covering the core aspects of the subjects in which the candidate is likely to be graduated.

8. ATTENDANCE REGULATIONS AND CONDONATION:

- (i) A student will be eligible to appear for end semester examinations, if he/she acquires a minimum of 75% of attendance in aggregate of all the subjects.
- (ii) Condonation for shortage of attendance in aggregate, up to 10% on medical grounds (Above 65% and below 75%) in any semester may be granted by the College Academic Committee. However, the subject of granting condonation is totally at the discretion of the College Academic Committee (CAC).
- (iii) The student will not be promoted to the next semester unless he/she satisfies the attendance requirements of the present semester as applicable. They may seek re-admission for that semester, as and when offered next by the Department.
- (iv) Shortage of Attendance below 65% in aggregate in no case be condoned
- (v) Students with less than 65% of attendance in any semester are not eligible to take up the end examination of that particular semester and their registration for examination will be cancelled.
- (vi) A stipulated fee to be paid by the student towards condonation of attendance.
- (vii) Attendance may also be condoned for those who participate in Intercollegiate/university sports, co- and extracurricular activities provided their attendance is in the minimum prescribed range for the purpose (>65% and <75%) and recommended by the concerned authority and condonation fees is to be paid.
- (viii) A student will be condoned only twice during his entire course of study.

9. MINIMUM ACADEMIC REQUIREMENTS:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in **S.No.8**.

- (i) A student will be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or project if he/she secures not less than a minimum of 35% of marks exclusively in the end semester examinations in each of the subjects, for which the candidate had appeared. However, the candidate should have secured a minimum of 40% marks in both external and internal components put together to declare eligible for pass in the subject.
- (ii) A student will be promoted from first sem to second sem , second sem to third and third to

- fourth sem, if he/she satisfies the minimum attendance requirement.
- (iii) A student will be promoted from 4th Semester to 5th Semester, if he/she fulfills the academic requirements of 50% of the credits up to 4th Semester from all the examinations (Regular and Supplementary) whether or not the candidate takes the examinations.
 - (iv) A student will be promoted from 6th to 7th Semester, only if he/she fulfills the academic requirements of 50% of the credits up to 6th Semester from, all the examinations (Regular and Supply) whether or not the candidate takes the examinations.
 - (v) There will be Supplementary examinations along with the Regular semester examinations enabling the students to give a fair chance to appear in the subject if any failed.
 - (vi) Student who fails in 8th Semester can re-appear for Advanced Supplementary Examinations soon after the announcement of result.

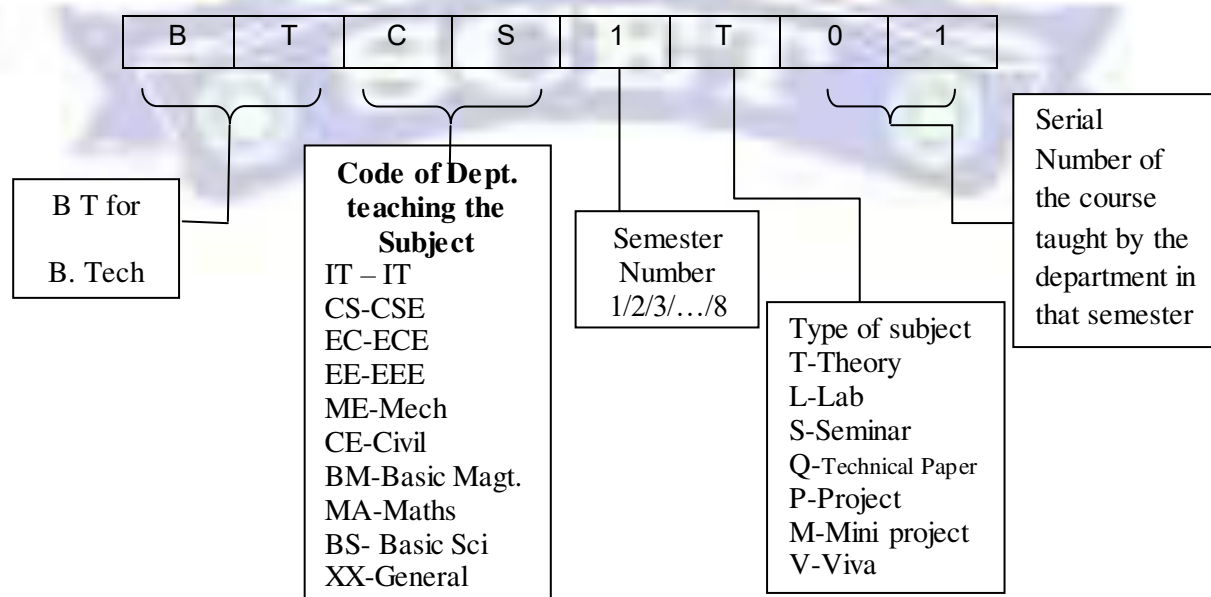
10. ELIGIBILITY FOR AWARD OF DEGREE:

A student shall be eligible for award of the B.Tech. Degree if he/she fulfills all the following conditions:

- (i) Pursued a course of study for a stipulated period of four years and not more than eight years from the year of admission.
- (ii) Registered and successfully completed all the components prescribed in the programme of study to which he/she is admitted.
- (iii) Obtained CGPA greater than or equal to 5 (minimum requirements for pass).
- (iv) Has no dues to the institute, hostels, libraries, NCC/NSS etc., and No disciplinary action is pending against him/her

11. COURSE CODE & COURSE NUMBERING SCHEME:

The subject codes will be given by the department teaching the subject. Each subject code contains 8 characters. The 8 characters for each subject will be filled as per the following guidelines.



12. GRADING SYSTEM:

12.1 Award of Grade :

(i) Grade Point Average (GPA):

a) The Grade Point Average (GPA) will be calculated according to the formula.

$$\text{GPA} = \frac{\sum C_i G_i}{\sum C_i} \text{ -----(1)}$$

Where C_i = number of credits for the subject i

G_i = grade points obtained by the student in the subject.

b) Semester Grade Point Average (SGPA) is awarded to candidates considering all the subjects of the semester. Zero grade points are also included in this computation.

c) To arrive at Cumulative Grade Point Average (CGPA), the formula (2) is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.

$$\text{CGPA} = \frac{\sum C_i G_i}{\sum C_i} \text{ -----(2)}$$

Where C_i = number of credits for the subject i

G_i = grade points obtained by the student in the subject.

(ii) After a student satisfies the requirements prescribed for the award of UG/PG Program he/she shall be placed in one of the following four grades. The award of the degree is based on CGPA on a grade point scale of 10.

CGPA	Award of Division
≥8.00*	First Class with Distinction
≥7.00	First Division
≥6.00	Second Division
≥5.00	Pass Division
<5.00	Unsatisfactory

* In addition to the required CGPA of 8, the student must have necessarily passed all the courses of every semester in the minimum stipulated period for the programme.

12.2 Award of Grade in Each Semester:

(i) Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester for each subject. The letter grades and the corresponding grade points are as given in the Table.

Percentage of Marks Scored	Letter Grade	Grade points
>=90	S	10
80 - 89	A	9
70-79	B	8
60-69	C	7
50-59	D	6
40-49	E	5
<40	F	Fail

- (ii) A student earns a minimum of 5 grade points (E grade) in a subject is declared to have successfully completed the subject, and is deemed to have earned the credits assigned to that subject. However it should be noted that a pass in any subject/term paper/seminar/project/mini project shall be governed by the rules mentioned in S.No.7.
- (iii) Grade Sheet: A grade sheet (memorandum) will be issued to each student indicating his/her performance in all courses taken in that semester and also indicating the grades and SGPA.
- (iv) Transcripts: After successful completion of the total programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued up to any point of study to any student on request and by paying the stipulated fee in force.
- (v) Candidates shall be permitted to apply for recounting/revaluation within the stipulated period with payment of prescribed fee.
- (vi) The Academic Council has to approve and recommend to the JNTUK, Kakinada for the award of a degree to any student.

13. SUPPLEMENTARY EXAMINATIONS: In addition to the Regular Final Examinations held at the end of each semester, Supplementary Final Examinations will be conducted during the academic year. A student can appear for any number of supplementary examinations till he/she clears all courses which he/she could not clear in the first attempt. However the maximum stipulated period cannot be relaxed under any circumstance.

14. ADVANCED SUPPLEMENTARY EXAMINATIONS: Candidate who fails in the subjects of 8th Semester can appear for Advanced Supplementary Examinations soon after the announcement of result.

15. ACADEMIC REGULATIONS FOR B.TECH (LATERAL ENTRY SCHEME):

- (i) The students have to acquire 132 credits from 3rd Semester to 8th Semester of B.Tech Programme (regular) for the award of the degree.
- (ii) Students, who fails to fulfill the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
- (iii) The same attendance regulations are to be adopted as per the rules mentioned in item No.8.

- (iv) **Rules for Promotion in to Next Higher Class:** (6th Semester to 7th Semester): A student shall be promoted from 6th Semester to 7th Semester only if he/she fulfills the academic requirements of 50% credits up to 6th Semester.

16. CONDUCT AND DISCIPLINE:

- (a) Students shall conduct themselves within and outside the premises of the institute in a manner befitting to be the student of our institution.
- (b) As per the order of Honorable Supreme Court of India, ragging in any form is considered as a criminal offence and is strictly banned. Any form of ragging will be severely dealt with.
- (c) The following acts of omission and/or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.
- (i) Lack of courtesy and decorum inducement behavior anywhere within or outside the campus.
- (ii) Willful damage or distribution of alcoholic drinks or any kind of narcotics or of fellow students/citizens.
- (d) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.
- (e) Mutilation or unauthorized possession of library books.
- (f) Noisy and unseemly behavior, disturbing studies of fellow students.
- (g) Hacking in computer systems (such as entering into other person's areas without prior permission, manipulation and/or damage of computer hardware and software or any other cybercrime etc).
- (h) Usage of cells phones and cameras in the class room/campus.
- (i) Plagiarism of any nature in any academic report of submission.
- (j) Any other act of gross indiscipline as decided by the academic council from time to me.
- (k) Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute / hostel, debarment from examination, disallowing the use of certain facilities of the institute, suspension for a specified period or even outright expulsion from the institute, or even handing over the case to appropriate law enforcement authorizes or the judiciary, as required by the circumstances.
- (l) For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the chief Warden, the Head of the Department and the principal respectively, shall have the authority to reprimand or impose fine.
- (m) Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the principal for taking appropriate action.
- (n) All cases of serious offence, possible requiring punishment other than reprimand, shall be reported to the Academic council.
- (o) The Institute Level Standing Disciplinary Action Committee constituted by the academic council, shall be the authority to investigate the details of the offence, and recommend

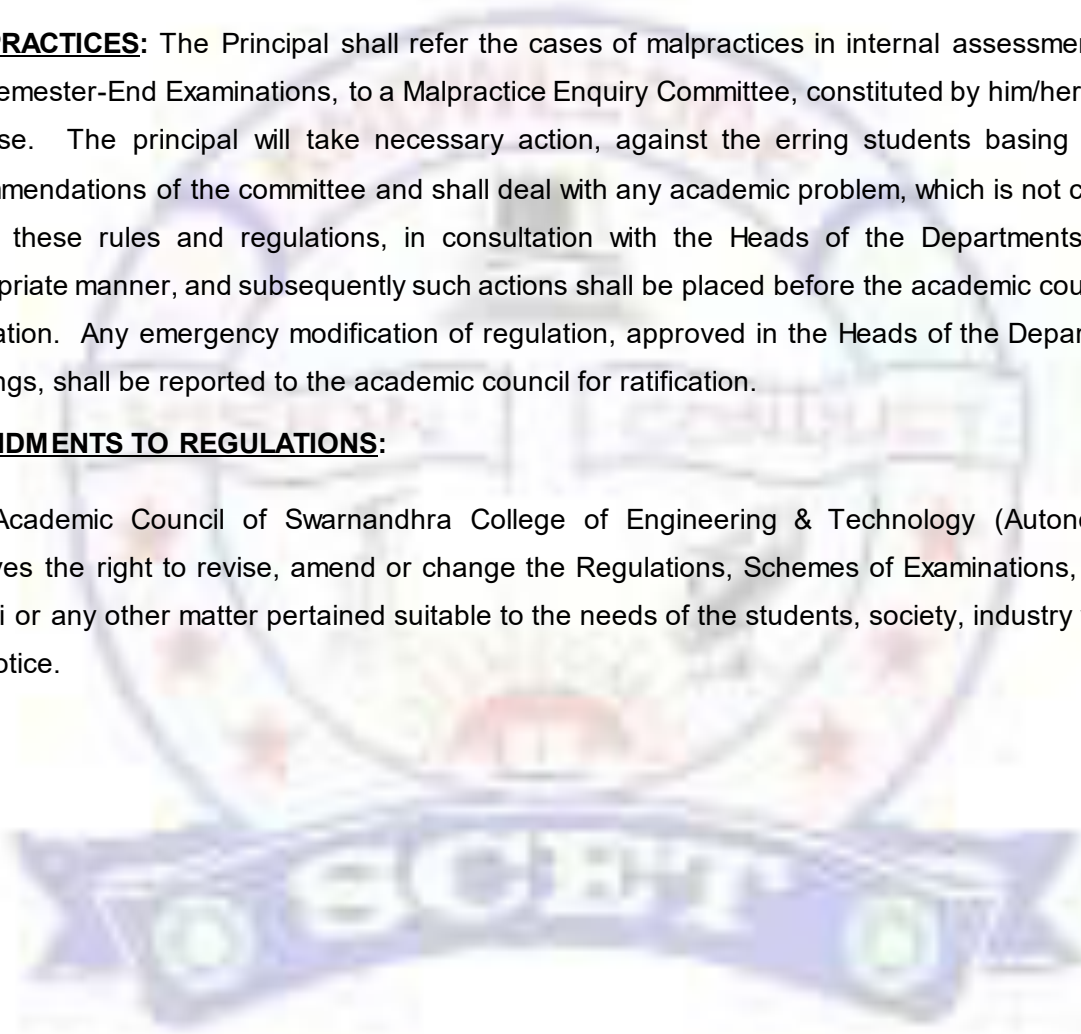
disciplinary action based on the nature and extent of the offence committed.

- (p) The Principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the Programmes Committee in an appropriate manner, and subsequently such action shall be placed before the academic council for ratification, Any emergency modification of regulation, approved by the academic council earlier, shall be reported to the academic council for ratification.
- (q) “**Grievance and Redressal Committee**” (**General**) constituted by the principal shall deal with all grievances pertaining to the academic / administrative/disciplinary matters.
- (r) All the students must abide by the code and conduct rules of the college.

17. MALPRACTICES: The Principal shall refer the cases of malpractices in internal assessment tests and Semester-End Examinations, to a Malpractice Enquiry Committee, constituted by him/her for the purpose. The principal will take necessary action, against the erring students basing on the recommendations of the committee and shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the Heads of the Departments in an appropriate manner, and subsequently such actions shall be placed before the academic council for ratification. Any emergency modification of regulation, approved in the Heads of the Departments meetings, shall be reported to the academic council for ratification.

18. AMENDMENTS TO REGULATIONS:

The Academic Council of Swarnandhra College of Engineering & Technology (Autonomous) reserves the right to revise, amend or change the Regulations, Schemes of Examinations, and/or Syllabi or any other matter pertained suitable to the needs of the students, society, industry without any notice.



**AUTONOMOUS-COURSE STRUCTURE
DEPARTMENT OF CIVIL ENGINEERING**

B. Tech

I Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTBS1T01	English-I	3	1	-	3	30	70	100
2	BTMA1T01	Differential Equations	3	1	-	3	30	70	100
3	BTEE1T01	Basic Electrical & Electronics	3	1	-	3	30	70	100
4	BTBS1T03	Engineering Physics	3	1	-	3	30	70	100
5	BTCS1T01	C Programming	3	1	-	3	30	70	100
6	BTME1T01	Engineering Drawing	-	1	3	3	30	70	100
7	BTBS1L01	English Communication Skills Lab-I	-	-	3	2	25	50	75
8	BTBS1L03	Engineering Physics Lab	-	-	3	2	25	50	75
9	BTCS1L01	C-Programming Lab	-	-	3	2	25	50	75
Total						24	255	570	825

B. Tech

II Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTBS2T01	English-II	3	1		3	30	70	100
2	BTMA2T01	Linear Algebra & Vector Calculus	3	1		3	30	70	100
3	BTMA2T02	Numerical Methods & Integral Transforms	3	1		3	30	70	100
4	BTBS2T02	Engineering Chemistry	3	1		3	30	70	100
5	BTBS2T04	Environmental Studies	3	1		3	30	70	100
6	BTME2T02	Engineering Mechanics	3	1	-	3	30	70	100
7	BTBS2L01	English Communication Skills Lab-II		-	3	2	25	50	75
8	BTBS2L02	Engineering Chemistry Lab		-	3	2	25	50	75
9	BTME2L01	Engineering Work shop		-	3	2	25	50	75
Total						24	255	570	825

Note:L=Lecture Hours; T=Tutorial hours; P=Practical hours; C=Credits; I=Internal Evaluation; E=External Evaluation ; T.M=Total Marks

**AUTONOMOUS-COURSE STRUCTURE
DEPARTMENT OF CIVIL ENGINEERING**

B. Tech

III -Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE3T01	Strength of Materials -I	3	1	-	3	30	70	100
2	BTCE3T02	Fluid Mechanics	3	1	-	3	30	70	100
3	BTCE3T03	Surveying	3	1	-	3	30	70	100
4	BTCE3T04	Building Materials and Construction	3	1	-	3	30	70	100
5	BTCE3T05	Engineering Geology	3	1	-	3	30	70	100
6	BTBM3T01	Managerial Economics and Financial Analysis	3	1	-	3	30	70	100
7	BTCE3L01	Engineering Geology Lab	-	-	3	2	25	50	75
8	BTME3L02	Strength of Materials Lab	-	-	3	2	25	50	75
9	BTBS3L01	Soft Skills/Aptitude Lab-I	-	-	-	1	25		25
		Total				23	255	520	775

B. Tech

III -Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE4T01	Hydraulics & Hydraulic Machinery	3	1	-	3	30	70	100
2	BTCE4T02	Strength of Materials-II	3	1	-	3	30	70	100
3	BTCE4T03	Building Planning & Drawing	3	1	-	3	30	70	100
4	BTCE4T04	Concrete Technology	3	1	-	3	30	70	100
5	BTCE4T05	Structural Analysis-I	3	1	-	3	30	70	100
6	BTMA4T01	Probability & Statistics	3	1	-	3	30	70	100
7	BTCE4L01	Surveying Lab	-	-	3	2	25	50	75
8	BTME4L03	Fluid Mechanics and Hydraulic Machinery Lab	-	-	3	2	25	50	75
9	BTBS4L01	Soft Skills /Aptitude Lab-II	-	-	-	1	25		25
		Total				23	255	520	775

Note:L=Lecture Hours; T=Tutorial hours; P=Practical hours; C=Credits; I=Internal Evaluation; E=External Evaluation ; T.M=Total Marks

**AUTONOMOUS-COURSE STRUCTURE
DEPARTMENT OF CIVIL ENGINEERING**

B. Tech

V -Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE5T01	Structural Analysis-II	3	1	-	3	30	70	100
2	BTCE5T02	Environmental Engineering-I	3	1	-	3	30	70	100
3	BTCE5T03	Design & Drawing of Reinforced Concrete Structures-I	3	1	-	3	30	70	100
4	BTCE5T04	Geotechnical Engineering	3	1	-	3	30	70	100
5	BTCE5T05	Water Resources Engineering-I	3	1	-	3	30	70	100
6	BTCE5T06	Transportation Engineering	3	1	-	3	30	70	100
7	BTCE5L01	Geotechnical Engg Lab	-	-	3	2	25	50	75
8	BTCE5L02	Environmental Engg Lab	-	-	3	2	25	50	75
9	BTCE5S01	Seminar	-	-		2	25	25	50
		Total				24	255	545	800

B. Tech

VI -Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE6T01	Foundation Engineering	3	1	-	3	30	70	100
2	BTCE6T02	Design & Drawing of Steel Structures	3	1	-	3	30	70	100
3	BTCE6T03	Water resources Engineering-II	3	1	-	3	30	70	100
4	BTCE6T04	Design& Drawing of Reinforced Concrete Structures-II	3	1	-	3	30	70	100
5	BTCE6T05	Railway and Harbour Engineering	3	1	-	3	30	70	100
6		ELECTIVE-I	3	1	-	3	30	70	100
7	BTCE6L01	Transportation Engineering Lab	-	-	3	2	25	50	75
8	BTME6L04	Computer Aided Engineering Drawing Practice Lab	-	-	3	2	25	50	75
9	BTCE6Q01	Technical Paper	-	-		2	25	25	50
		Total				24	255	545	800

Note: L=Lecture Hours; T=Tutorial hours; P=Practical hours; C=Credits; I=Internal Evaluation; E=External Evaluation ; T.M=Total Marks

ELECTIVE-I		
S.No.	Subject Code	Subject
1	BTCE6TE1	Disaster Management
2	BTCE6TE2	Industrial Water & Waste Water Management
3	BTCE6TE3	Urban Transportation Planning Safety Engineering
4	BTCE6TE4	Ground Water Development and Management

**AUTONOMOUS-COURSE STRUCTURE
DEPARTMENT OF CIVIL ENGINEERING**

B. Tech

VII -Semester

.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE7T01	Advanced Structural Analysis	3	1	-	3	30	70	100
2	BTCE7T02	Environmental Engineering-II	3	1	-	3	30	70	100
3	BTCE7T03	Remote Sensing and GIS Applications	3	1	-	3	30	70	100
4	BTCE7T04	Design & Drawing of Irrigation Structures	3	1	-	3	30	70	100
5		ELECTIVE-II	3	1	-	3	30	70	100
6	BTBM7T01	Professional Ethics & Intellectual Property Rights	3	-	-	-	Mandatory		
7	BTCE7L01	GIS & CAD Lab	-	-	3	2	25	50	75
8	BTCE7L02	Concrete Technology Lab	-	-	3	2	25	50	75
9	BTCE7M01	Mini Project	-	-	-	2	25	25	50
		Total	18	06	08	21	225	475	700

B. Tech

VIII -Semester

S.No	Subject Code	Subject	L	T	P	C	I	E	T. M
1	BTCE8T01	Estimating, Specifications & Contracts	3	1	-	3	30	70	100
2		ELECTIVE-III	3	1	-	3	30	70	100
		ELECTIVE-IV	3	1	-	3	30	70	100
3	BTCE8P01	Project	-	-	6	6	60	140	200
4	BTCE8V02	Comprehensive Viva	-	-	-	2	50	-	50
		Total	10	3	9	17	200	350	550

ELECTIVE-II		
S.No.	Subject Code	Subject
1	BTCE7TE1	Air Pollution and Control
2	BTCE7TE2	Repair and Rehabilitation of Structures
3	BTCE7TE3	Soil Dynamics and Machine Foundations
4	BTCE7TE4	Construction Technology and Project Management

ELECTIVE-III		
S.No.	Subject Code	Subject
1	BTCE8TE1	Environmental Impact Assessment and Management
2	BTCE8TE2	Finite Element Methods In Civil Engineering
3	BTCE8TE3	Ground Improvement Techniques
4	BTCE8TE4	Earthquake Resistant Design

ELECTIVE-IV		
S.No.	Subject Code	Subject
1	BTCE8TE5	Water Shed Management
2	BTCE8TE6	Pavement Analysis and Design
3	BTCE8TE7	Advanced Structural Design
4	BTCE8TE8	Bridge Engineering

Note:L=Lecture Hours; T=Tutorial hours; P=Practical hours; C=Credits; I=Internal Evaluation; E=External Evaluation ; T.M=Total Marks



B. TECH 1st SEMESTER	L	P	C
	3+1	-	3
ENGLISH – I			

DETAILED TEXT-I English Essentials : Recommended Topics :

1. IN LONDON: M.K.GANDHI

OBJECTIVE: To apprise the learner how Gandhi spent a period of three years in London as a student.

OUTCOME: The learner will understand how Gandhi grew in introspection and maturity.

2. THE KNOWLEDGE SOCIETY- APJ KALAM

OBJECTIVE: To make the learners rediscover India as a land of Knowledge.

OUTCOME: The learners will achieve a higher quality of life, strength and sovereignty of a developed nation.

3. PRINCIPLES OF GOOD WRITING:

OBJECTIVE: To inform the learners how to write clearly and logically.

OUTCOME: The learner will be able to think clearly and logically and write clearly and logically.

4. MAN’S PERIL

OBJECTIVE: To inform the learner that all men are in peril.

OUTCOME: The learner will understand that all men can come together and avert the peril.

5. THE DYING SUN—SIR JAMES JEANS

OBJECTIVE: This excerpt from the book “The Mysterious Universe” presents the mysterious nature of the Universe and the stars which present numerous problems to the scientific mind. Sir James Jeans uses a poetic approach to discuss the scientific phenomena.

OUTCOME: This provides the students to think about the scientific phenomena from a different angle and also exposes the readers to poetic expressions.

6. LUCK—MARK TWAIN

OBJECTIVE: This is a short story about a man’s public image and his true nature. The theme of the story is that luck can be a factor of life, so that even if one is incompetent but lucky, one can still succeed.

OUTCOME: The story is humorous in that it contains a lot of irony. Thus this develops in the learner understand humorous texts and use of words for irony.

Text Book : “English Essentials” by Ravindra Publications

NON-DETAILED TEXT: (From Modern Trailblazers of Orient Blackswan) (Common single Text book for two semesters) [Semester I (1 to 4 lessons)/ Semester II (5 to 8 lessons)]

1. G. D. Naidu

OBJECTIVE: To inspire the learners by G. D. Naidu's example of inventions and contributions.

OUTCOME: The learner will be in a position to emulate G. D. Naidu and take to practical applications.

2. G. R. Gopinath

OBJECTIVE: To inspire the learners by his example of inventions.

OUTCOME: Like G. R. Gopinath, the learners will be able to achieve much at a low cost and help the common man.

3. Sudhamurthy

OBJECTIVE: To inspire the learners by the unique interests and contributions of Sudhamurthy.

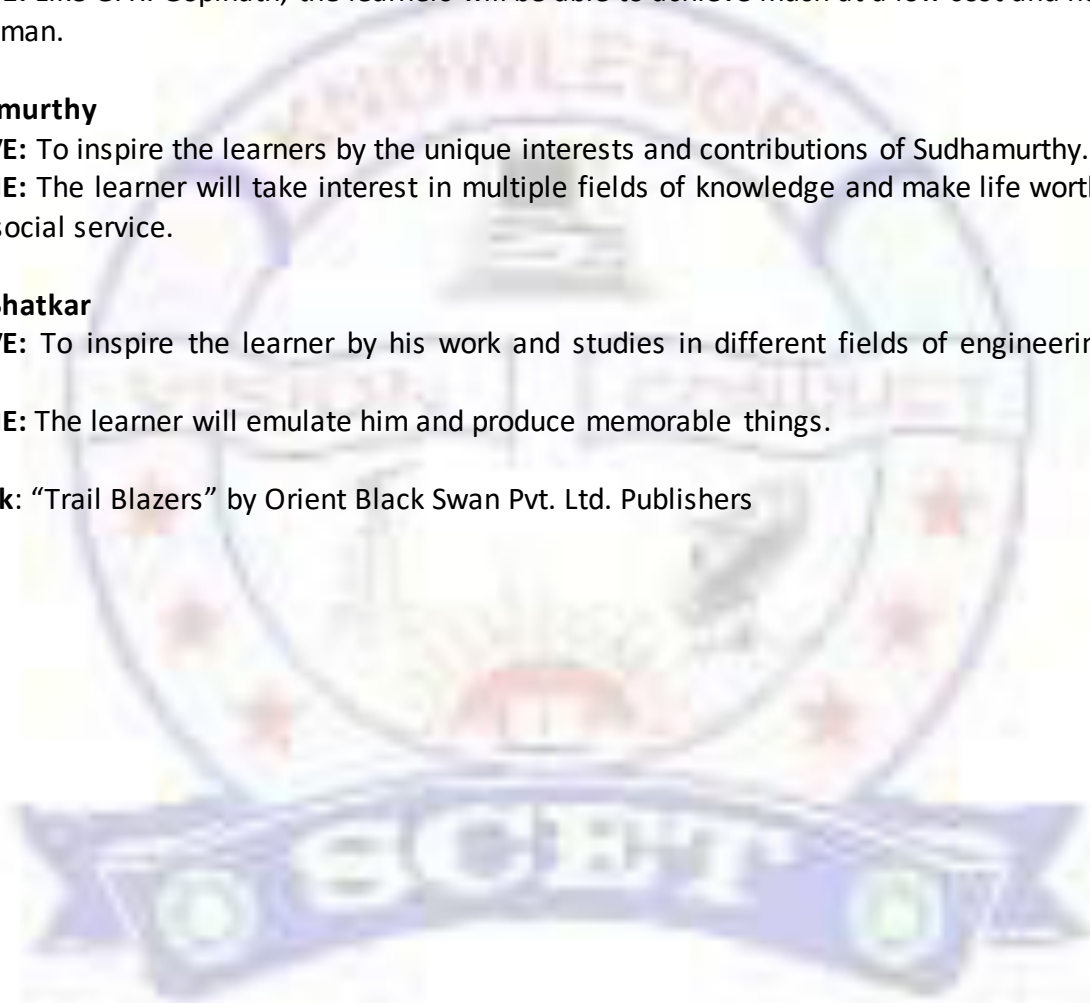
OUTCOME: The learner will take interest in multiple fields of knowledge and make life worthwhile through social service.

4. Vijay Bhatkar

OBJECTIVE: To inspire the learner by his work and studies in different fields of engineering and science.

OUTCOME: The learner will emulate him and produce memorable things.

Text Book: "Trail Blazers" by Orient Black Swan Pvt. Ltd. Publishers



B. TECH 1st SEMESTER	L	P	C
	3+1	-	3
DIFFERENTIAL EQUATIONS			

UNIT – I: Differential equations of first order and first degree

Linear-Bernoulli-Exact-Reducible to exact.

Applications: Newton’s Law of cooling-Law of natural growth and decay- Orthogonal trajectories.

UNIT – II: Linear differential equations of higher order

Non-homogeneous equations of higher order with constant coefficients with RHS term of the type e^{ax} , $\sin ax$, $\cos ax$, polynomials in x , $e^{ax}V(x)$, $xV(x)$. Method of Variation of parameters for solving second order linear differential equations

Applications: LCR circuit, Simple Harmonic motion

UNIT – III: Laplace transforms

Laplace transforms of standard functions-Shifting Theorems, Transforms of derivatives and integrals – Unit step function –Dirac’s delta function-

UNIT – IV: Inverse Laplace transforms

Inverse Laplace transforms -Convolution theorem (without proof).

Application: Solutions of ordinary differential equations of using Laplace transforms.

UNIT – V: Mean value theorems (Without poof) & Partial Differentiation

Rolle’s Theorem-Lagrange’s mean value Theorem –Cauchy’s mean value theorem - Taylor series and Maclaurin’s series expansions of functions of single variable - Jacobian, Functional dependence.

UNIT – VI: First order Partial differential equations

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations-Solutions of Linear Partial differential equations with constant coefficients by the method of separation of Variables.

Books:

1. **B.S. GREWAL**, Higher Engineering Mathematics, 42nd Edition, Khanna Publishers
2. **B.V. RAMANA**, Higher Engineering Mathematics, Tata McGraw Hill

Reference Book:

1. **ERWIN KREYSZIG**, Advanced Engineering Mathematics, 9th Edition, Wiley-India

B. TECH 1st SEMESTER	L	P	C
	3+1	-	3
BASIC ELECTRICAL & ELECTRONICS			

UNIT – I: BASIC CONCEPTS, LAWS AND PRINCIPLES

Introduction – Atomic Structure and Electric Charge – Conductors, Insulators, and Semiconductors – Electric Field and Magnetic Field – Electric Current, Resistance, Potential, and Potential Difference – Ohm’s Law – Work, Power and Energy – Electromagnetism and Electromagnetic Induction – Induced EMF – Inductance of a Coil – Electrical Circuit Elements (Resistor, Inductor, and Capacitor) – Voltage & Current Sources.

UNIT – II: AC FUNDAMENTALS

Generation of Alternating Voltage – Concept of Average Value and Root Mean Square Value of an Alternating Quantity – Behavior of R, L, and C in AC Circuits – Power in AC Circuits – AC Series & Parallel Circuits.

Three-Phase Circuits: Generation of Three Phase Voltages – Three-Phase Winding Connections (Y and Δ Connections) – Measurement of Three-phase Power.

UNIT – III: MEASUREMENT AND MEASURING INSTRUMENTS

Introduction – Analog and Digital Instruments – Passive and Active Instruments – Static Characteristics – Linear and Non-linear Systems – Dynamic Characteristics – Classification of the Instrument System – Measurement Error – Indicating type Instruments – Measurement of Power, Measurement of Energy – Instrument Transformers – Megger & Measurement of Insulation Resistance – Multi-meter and Measurement of Resistance

UNIT – IV: SEMI CONDUCTOR DEVICES

Introduction – Binding Forces between Atoms in Semiconductor Materials – Extrinsic Semiconductors – Semiconductor Diodes – Zener Diode – Bipolar Junction Transistors – Field Effect Transistors – MOSFET – Silicon-controlled Rectifier – DIAC – TRIAC.

UNIT – V: DIGITAL ELECTRONICS

Introduction – Number Systems – Octal Number Systems – Hexadecimal Number System – Logic Gates – Boolean Algebra – De Morgan’s Theorem – Combinational Circuits – Simplification of Boolean Expressions using De Morgan’s Theorem – Universal Gates.

UNIT – VI: BASICS OF COMMUNICATION

Introduction – Elements of Communication Systems – Basic Electronic Communication – Bandwidth and its Significance – Types of Modulation – Comparison of Amplitude Modulation and Frequency Modulation – Demodulation -Basics of Microwave and Satellite Communication – Television Systems – Mobile Communication.

Text Book (s):

1. Basic Electrical and Electronics Engineering – S. K. Bhattacharya, Pearson Publications.
2. Basic Electrical & Electronics Engineering – J. B. Gupta, S. K. Kataria & Sons Publications.

References:

1. Engineering Circuit Analysis – William H. Hayt & Jack E. Kemmerly, Tata McGraw-Hill Company, 7th Edition.
2. A Course in Electrical and Electronic Measurements and Instrumentation – A. K. Sawhney, Dhanpat Rai & Co.
3. Electronic Devices and Circuit Theory – Robert L. Boylestad & Louis Nashelsky, Prentice-Hall of India, 6th Edition.
4. Electrical & Electronics Engineering – J. B. Gupta, S. K. Kataria & Sons Publications.
5. Engineering Basics: Electrical, Electronics and Computer Engineering – Thyagarajan T., New Age International, 3rd edition (2007).



B. TECH 1st SEMESTER	L	P	C
	3+1	-	3
ENGINEERING PHYSICS			

UNIT – I: CRYSTALLOGRAPHY AND X-RAY DIFFRACTION

(6hours)

Introduction – Space lattice – Basis – Unit Cell – Lattice parameters – Crystal systems – Bravais lattices – Structures and packing fractions of SC, BCC and FCC-Directions and planes in crystals – Miller indices – Separation between successive (h k l) planes – Bragg’s law- Bragg’s Spectrometer.

UNIT – II: QUANTUM MECHANICS FOR ELECTRONIC TRANSPORT

QUANTUM MECHANICS AND ELECTRON THEORY OF METALS: Schrodinger Time Independent and Time Dependent wave equations – Particle in a box – Classical free electron theory – electrical conductivity – Mean free path – Relaxation time and drift velocity – Quantum free electron theory – Fermi – Dirac distribution function (analytical) and its dependence on temperature – Fermi energy.

BAND THEORY OF SOLIDS: Bloch theorem (qualitative) – Kronig – Penney model – Origin of energy band formation in solids – Classification of materials into conductors, semi – conductors & insulators – Concepts of effective mass of electron and concept of hole.

UNIT – III: MAGNETIC RESPONSE OF MATERIALS & SUPERCONDUCTIVITY

MAGNETIC PROPERTIES : Magnetic permeability – Magnetization – Origin of magnetic moment – Classification of Magnetic materials – Dia, Para, Ferro, Anti-Ferro and Ferri-magnetism – Hysteresis curve by Weiss Domain Theory -Soft and Hard Magnetic materials

SUPERCONDUCTIVITY: General properties – Meissner effect – Type I and Type II superconductors – London’s equations – Penetration depth – BCS Theory- Flux quantization –DC and AC Josephson effects-Applications of Superconductors .

UNIT – IV: COHERENT OPTICS – COMMUNICATIONS AND STRUCTURE OF MATERIALS

LASERS: Introduction – coherent sources – Characteristics of lasers – Spontaneous and Stimulated emission of radiation – Einstein’s coefficients – three level and four level laser pumping schemes – Population inversion – Ruby laser – Helium-Neon laser- Applications of Laser.

FIBER OPTICS: Introduction-Principle of wave propagation in Optical Fiber-Acceptance angle and acceptance cone-Numerical aperture-Types of optical fibers - Application of optical fibers.

UNIT – V: SEMICONDUCTOR PHYSICS

Introduction – Intrinsic semiconductor and carrier concentration – Equation for conductivity – Extrinsic semiconductor and carrier concentration – Drift and diffusion – Einstein’s equation – Hall Effect – direct & indirect band gap semiconductors.

UNIT – VI: DIELECTRIC PROPERTIES & ACOUSTICS

DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, ionic and orientation polarizations - Internal fields in solids - Clausius-Mossotti equation - Ferro and Piezo electricities.

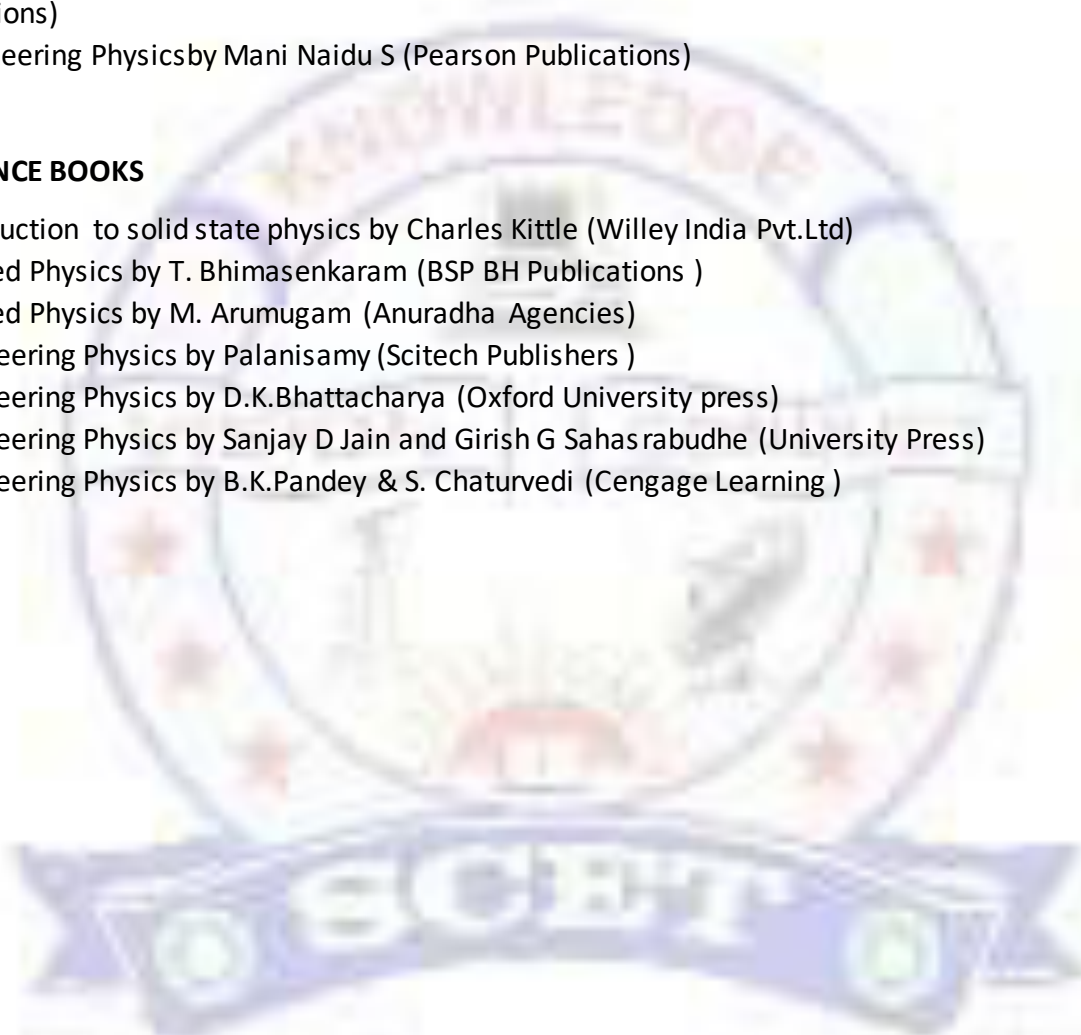
ACOUSTICS: Sound absorption, absorption coefficient and its measurements, Reverberations time – Sabine's formula, Eyring's formula.

TEXT BOOKS

1. A Text Book of Engineering Physics by M. N. Avadhanulu & P. G. Kshirasagar (S. Chand publications)
2. Engineering Physics by Mani Naidu S (Pearson Publications)

REFERENCE BOOKS

1. Introduction to solid state physics by Charles Kittel (Wiley India Pvt.Ltd)
2. Applied Physics by T. Bhimasankaram (BSP BH Publications)
3. Applied Physics by M. Arumugam (Anuradha Agencies)
4. Engineering Physics by Palanisamy (Scitech Publishers)
5. Engineering Physics by D.K.Bhattacharya (Oxford University press)
6. Engineering Physics by Sanjay D Jain and Girish G Sahasrabudhe (University Press)
7. Engineering Physics by B.K.Pandey & S. Chaturvedi (Cengage Learning)



B. TECH 1st SEMESTER	L	P	C
	3+1	-	3
C-PROGRAMMING			

UNIT-I:

INTRODUCTION:

Introduction to Computer System, Hardware and Software, Algorithm, Flowchart, Types of Computer Languages.

FUNDAMENTALS OF C:

C Character Set, Tokens, Identifiers, Constants, Basic Data Types and Sizes, Operators: Arithmetic Operators, Relational Operators, Logical Operators, Conditional Operator, Increment and Decrement Operators, Assignment Operators, Bit-wise Operators, Special Operators, Expressions, Operator Precedence and Order of Evaluation, Evaluation of Expressions, Type Conversions: Implicit and Explicit.

UNIT-II:

CONTROL STRUCTURES:

Selection Statements: if-else Statement, null else Statement, nested if Statement, else-if Statement, switch Statement, Applications.

Iterative Statements: break statement, continue statement, counter and event controlled loops, while loop, do-while loop, for loop, Looping Applications.

ARRAYS:

Introduction to arrays, declaration, initialization and accessing array elements of 1-D Arrays, declaration, initialization and accessing elements of 2-D Arrays, Strings, String Functions, Application of Arrays.

UNIT-III:

FUNCTIONS:

Introduction to Functions, User-Defined & Library Functions, Parameter Passing, Return Statement Storage Class, Recursion, Recursive Functions and Recursive Solutions for different problems, C Preprocessor, Passing 1-D Arrays and 2-D Arrays to Functions.

UNIT-IV:

POINTERS:

Introduction to Pointers, Declaration, Initialization and Accessing a Pointer, Passing by Address, Pointer as Function Argument, Pointer Arithmetic, Pointer to Pointer, Pointer to Multi-dimensional Arrays, Dynamic Memory Management Functions, Command Line Arguments.

UNIT-V:

DERIVED TYPES:

Definition, Declaration and Initialization of Structures, Accessing Structures, Nested structures, Array of Structures, Structures and Functions, pointer to structure, Self-Referential Structures, bit-fields, Definition, Declaration and Initialization of Unions, Type-definition.

UNIT-VI:

FILES:

Introduction to Files, File Streams: binary and text, Formatted I/O functions: fprintf(), fscanf(), and File I/O Functions: feof(), rewind(), ferror(), fopen(), fclose().

Text Books:

The C Programming Language	Kernighan & Ritchie	PHI
Programming in C: A Practical Approach	Ajay Mittal	Pearson
Programming in ANSI C	E Balagurusamy	TMH

Reference Books:

Understanding and using C Pointers	Richard Reese	Oreilly
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B. TECH 1st SEMESTER	L	P	C
	1	3	3
ENGINEERING DRAWING			

UNIT – I:

INTRODUCTION: Engineering Drawing and Plane Curves, Use of Drawing Instruments and Conventions.

GEOMETRICAL CONSTRUCTIONS: Constructions of Polygons using General Method

CONICS: Construction of Ellipse, Parabola and Hyperbola by Eccentricity Method.

CYCLOIDAL CURVES: Construction of Cycloid, Epi-Cycloid and Hypo-Cycloid.

UNIT – II:

PROJECTIONS OF POINTS AND LINES: Introduction to Orthographic Projections - Projection of Points, **PROJECTION OF STRAIGHT LINES:** Parallel to both the Planes, Parallel to One Plane and Inclined to Other Plane, Inclined to Both the Planes.

UNIT – III:

PROJECTIONS OF PLANES: Introduction to Perpendicular Planes, Perpendicular to both the Reference Planes, Perpendicular to One Plane and Parallel to Other Plane, Perpendicular to One Plane and Inclined to Other Plane, Inclined to Both the Reference Planes.

UNIT – IV:

PROJECTIONS OF SOLIDS: Projections of Simple Solids like Prism, Cylinder, Pyramids and Cones. Projections of Solids with Axis Perpendicular to one Plane, Projections of Solids with Axis Parallel to Both the Planes.

UNIT – V:

PROJECTIONS OF SOLIDS – AXIS INCLINED TO ONE PLANE: Projections of Solids with Axis inclined to one plane and parallel to other Plane (Axis inclined to the VP and Parallel to the HP, Axis Inclined to the HP and Parallel to the VP).

UNIT – VI:

ISOMETRIC PROJECTIONS: Principles of Isometric Projections - Isometric Scale, Isometric Projections of Planes, Simple Solids, Conversion of Isometric to Orthographic Views and Vice Versa.

TEXT BOOKS:

- 1) Engineering Drawing by K.L. Narayana & P. Khannaiah., SCIETECH Publishers.
- 2) Engineering Drawing by M.B. Shah & B.C. Rana., Pearson’s Publishers.

REFERENCE BOOKS:

- 1) Engineering Drawing by N.D. Bhatt, Charotar Publishers.
- 2) Engineering Drawing by K. Venugopal., NEW AGE Publications.

B. TECH 1st SEMESTER	L	P	C
	-	3	2
ENGLISH COMMUNICATION SKILLS LAB – I			

OBJECTIVE: To impart to the learner the skills of grammar as well as communication through listening, speaking, reading, and writing including soft, that is life skills.

BASIC COMMUNICATION SKILLS

UNIT 1 A. Greeting and Introductions
B. Pure Vowels

UNIT 2 A. Asking for information and Requests
B. Diphthongs

UNIT 3 A. Invitations
B. Consonants

UNIT 4 A. Commands and Instructions
B. Accent and Rhythm

UNIT 5 A. Suggestions and Opinions
B. Intonation

Text Book: 'Strengthen your Communication Skills' Part-A by Maruthi Publications

Reference Books:

1. INFOTECH English (Maruthi Publications)
2. Personality Development and Soft Skills (Oxford University Press, New Delhi)

B. TECH 1st SEMESTER	L	P	C
	-	3	2
ENGINEERING PHYSICS LAB			

List of Experiments

Student has to do Any Ten Experiments of the Following

1. Determination of the Rigidity Modulus of given material wire using Torsional Pendulum.
2. Determination of the Acceleration due to Gravity and Radius of Gyration using Compound Pendulum.
3. Determination the Frequency of vibration in Transverse and Longitudinal Modes using Melde's Apparatus.
4. Determination Frequency of A.C supply by using Sonometer
5. Determination of wavelength using Laser.
6. Determination of Numerical Aperture of an Optical Fiber.
7. Determination of the Planck's constant using Photo-Cell.
8. Study the variation of Magnetic Field along the axis of a solenoid coil using Stewart - Gee's Apparatus.
9. Determination of the Time Constant for a C-R Circuit.
10. Determination of the Band Gap of a Semiconductor using a p-n junction diode.
11. Study of Characteristic curves (I/V) of a Zener diode to determine its Breakdown voltage.
12. Determination of Thermoelectric coefficient of a Thermistor by using its Characteristic curve.

MANUAL:

1. Engineering Physics Lab Manual Prepared by Physics Faculty.

B. TECH 1st SEMESTER	L	P	C
	-	3	2
COMPUTER PROGRAMMING LAB			

Exercise 1

- a) Write a C Program to calculate the area of triangle, circumference of a circle.
- b) Write a C program to find the largest of three numbers using ternary operator.
- c) Write a C Program to swap two numbers without using a temporary variable.

Exercise 2

- a) Write a C program to find the roots of a Quadratic Equation.
- b) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)

Exercise 3

- a) Write a C program to find the sum of individual digits of a positive integer and find the reverse of the given number.
- b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence
- c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Exercise 4

- a) Write a C Program to print the multiplication table of a given number n up to a given value, where n is entered by the user.
- b) Write a C Program to enter a decimal number, and calculate and display the binary equivalent of that number.
- c) Write a C Program to check whether the given number is Armstrong number or not & Perfect number or not.

Exercise 5

- a) Write a C program to interchange the largest and smallest numbers in the array.
- b) Write a C program to Search and element in the array using linear search.

Exercise 6

- a) Write a C program to input two m x n matrices, check the compatibility and perform addition and multiplication of them

Exercise 7

Write a C program that uses functions to perform the following operations:

- i. To insert a sub-string in to given main string from a given position.
- ii. To delete n Characters from a given position in a given string.
- iii. To replace a character of string either from beginning or ending or at a specified location

Exercise 8

- a) Write C Programs for the following string operations without using the built in functions - to concatenate two strings - to append a string to another string - to compare two strings

Exercise 9

- a) Write C Programs for the following string operations without using the built in functions - to find the length of a string - to find whether a given string is palindrome or not

Exercise 10

- a) Write a C functions to find both the largest and smallest number of an array of integers.
- b) Write C programs illustrating call by value and call by reference concept.

Exercise 11

Write C programs that use both recursive and non-recursive functions for the following

- i) To find the factorial of a given integer.
- ii) To find the GCD (greatest common divisor) of two given integers.
- iii) To find Fibonacci sequence

Exercise 12

- a) Write a C program consisting of Pointer based function to exchange value of two integers using passing by address.
- b) Write a C program to swap two numbers using pointers
- c) Write a C Program to compare two arrays using pointers

Exercise 13

Examples which explores the use of structures, union and other user defined variables

Exercise 14

- a) Write a C program which copies one file to another using command line argument.
- b) Write a C program to count the number of characters and number of lines in a file.
- c) Write a C Program to merge two files into a third file. The names of the files must be entered using command line arguments.

B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
ENGLISH – II			

DETAILED TEXT-II : Sure Outcomes: English for Engineers and Technologists

Recommended Topics :

1. TECHNOLOGY WITH A HUMAN FACE

OBJECTIVE: To make the learner understand how modern life has been shaped by technology.

OUTCOME: The proposed technology is people’s technology. It serves the human person instead of making him the servant of machines.

2. CLIMATE CHANGE AND HUMAN STRATEGY

OBJECTIVE: To make the learner understand how the unequal heating of earth’s surface by the Sun, an atmospheric circulation pattern is developed and maintained.

OUTCOME: The learner’s understand that climate must be preserved.

3. EMRGING TECHNOLOGIES

OBJECTIVE: To introduce the technologies of the 20th century and 21st centuries to the learners.

OUTCOME: The learner will adopt the applications of modern technologies such as nanotechnology.

4. WATER- THE ELIXIR OF LIFE

OBJECTIVE: To inform the learner of the various advantages and characteristics of water.

OUTCOME: The learners will understand that water is the elixir of life.

5. THE SECRET OF WORK

OBJECTIVE: In this lesson, Swami Vivekananda highlights the importance of work for any development.

OUTCOME: The students will learn to work hard with devotion and dedication.

6. WORK BRINGS SOLACE

OBJECTIVE: In this lesson Abdul Kalam highlights the advantage of work.

OUTCOME: The students will understand the advantages of work. They will overcome their personal problems and address themselves to national and other problems.

Text Book : “Sure Outcomes” by Orient Black Swan Pvt. Ltd. Publishers

NON-DETAILED TEXT:

**(From Modern Trailblazers of Orient Blackswan)
(Common single Text book for two semesters)
(Semester I (1 to 4 lessons)/ Semester II (5 to 8 lessons))**

5. J.C. Bose

OBJECTIVE: To apprise of J.C.Bose's original contributions.

OUTCOME: The learner will be inspired by Bose's achievements so that he may start his own original work.

6. HomiJehangirBhaba

OBJECTIVE: To show Bhabha as the originator of nuclear experiments in India. **OUTCOME:** The learner will be inspired by Bhabha's achievements so as to make his own experiments.

7. Vikram Sarabhai

OBJECTIVE: To inform the learner of the pioneering experiments conducted by Sarabhai in nuclear energy and relevance of space programmes.

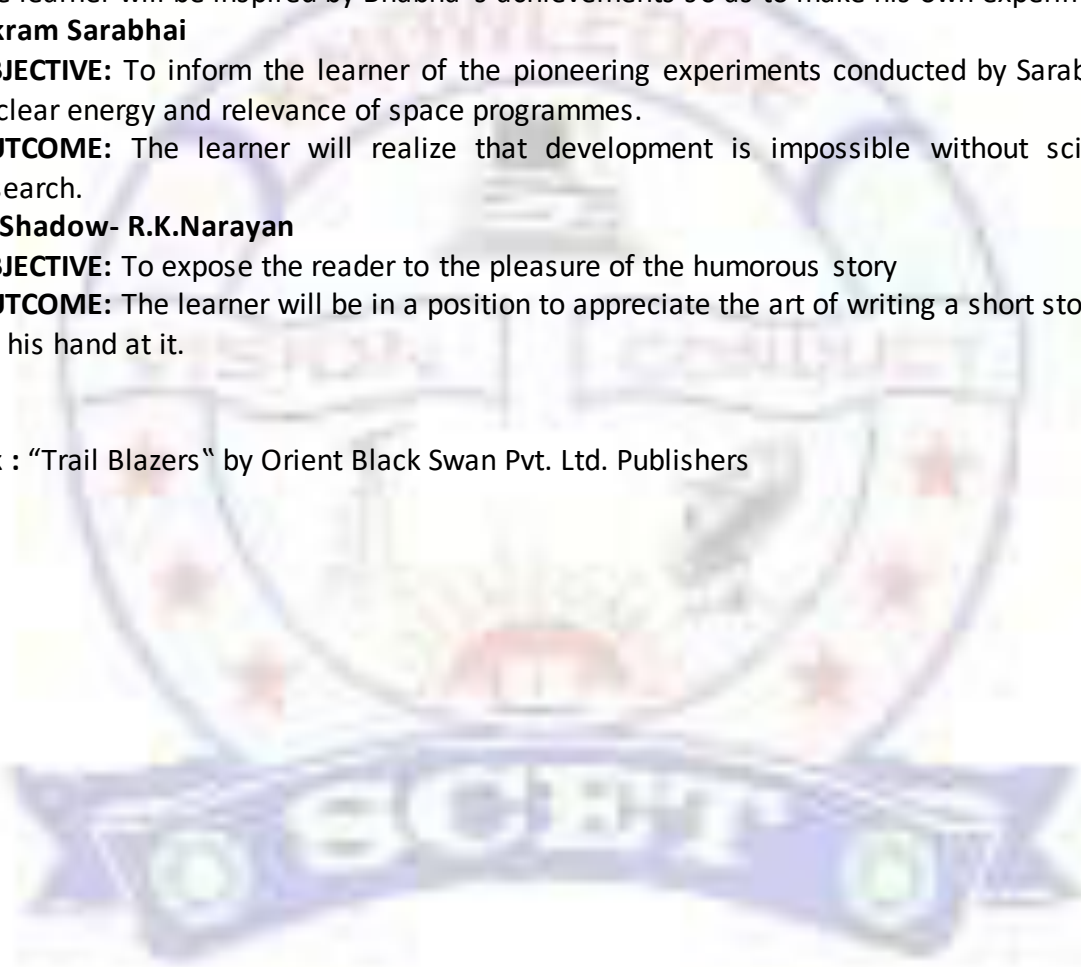
OUTCOME: The learner will realize that development is impossible without scientific research.

8. A Shadow- R.K.Narayan

OBJECTIVE: To expose the reader to the pleasure of the humorous story

OUTCOME: The learner will be in a position to appreciate the art of writing a short story and try his hand at it.

Text Book : "Trail Blazers" by Orient Black Swan Pvt. Ltd. Publishers



B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
LINEAR ALGEBRA & VECTOR CALCULUS			

UNIT I: Linear systems of equations

Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination- Gauss Jordan and Gauss Seidal Methods.

Application: Finding the current in an electrical circuit.

UNIT II: Eigen values - Eigen vectors and Quadratic forms

Eigen values - Eigen vectors– Properties (without proof)– Cayley-Hamilton Theorem (without proof) - Quadratic forms- Reduction of quadratic form to canonical form – Rank, index, signature and nature of the Quadratic form.

Applications: Finding Inverse and powers of a matrix by using Cayley-Hamilton theorem.

UNIT III: Multiple integrals

Multiple integrals - Double and triple integrals – Change of variables – Change of order of Integration

Application: Applications of Integration to Lengths, Volumes and Surface areas of solids of revolution in Cartesian and Polar Coordinates.

UNIT IV: Special functions

Beta and Gamma functions- Properties - Relation between Beta and Gamma functions

Application: Evaluation of improper integrals.

UNIT V: Vector Differentiation

Gradient- Divergence- Curl - Laplacian and second order operators -Vector identities

Application: Equation of continuity, potential surfaces

UNIT VI: Vector Integration

Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (without proof) and related problems.

Application: Work done by a force

Books:

1. **B.S. GREWAL**, Higher Engineering Mathematics, 42nd Edition, Khanna Publishers
2. **B.V. RAMANA**, Higher Engineering Mathematics, Tata McGraw Hill

Reference Books:

1. **ERWIN KREYSZIG**, Advanced Engineering Mathematics, 9th Edition, Wiley-India
2. **S. S. SASTRI (PHI)**, Introductory Methods of Numerical Analysis.
3. **V. RAVINDRANADH, P. VIJAYA LAXMI**, A Text Book on Mathematical Methods by Himalaya Publishing House.

B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
NUMERICAL METHODS & INTEGRAL TRANSFORMS			

UNIT – I: Solution of Algebraic and Transcendental Equations

Introduction- Bisection Method – Method of False Position – Iteration Method – Newton Raphson Method.

UNIT – II: Interpolation

Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols, Differences of a polynomial-Newton’s formulae for interpolation – Interpolation with unevenly spaced points – Lagrange’s Interpolation formula

UNIT – III: Numerical solution of Ordinary Differential equations

Solution by Taylor’s series-Picard’s Method of successive Approximations - Euler’s Method– Runge-Kutta Methods

UNIT – IV: Fourier Series

Introduction- Determination of Fourier coefficients – even and odd functions –change of interval– Half-range sine and cosine series

UNIT – V: Fourier Transforms

Fourier integral theorem (only statement) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms

UNIT –V I: Z-transform

Introduction– properties – Damping rule – Shifting rule – Initial and final value theorems - Inverse z transform- -Convolution theorem.

Applications: Solution of difference equation by Z-transforms.

Books:

1. **B.S. GREWAL**, Higher Engineering Mathematics, 42nd Edition, Khanna Publishers
2. **B.V. RAMANA**, Higher Engineering Mathematics, Tata McGraw Hill
3. **V. RAVINDRANADH, P. VIJAYA LAXMI**, A Text Book on Mathematical Methods by Himalaya Publishing House.

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1. **ERWIN KREYSZIG**, Advanced Engineering Mathematics, 9th Edition, Wiley-India
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B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
ENGINEERING CHEMISTRY			

UNIT – I: WATER TECHNOLOGY

Hard Water – Estimation of Hardness By EDTA Method – Potable Water - Sterilization and Disinfection – Boiler Feed Water – Boiler Troubles – Priming And Foaming , Scale Formation, Corrosion, Caustic Embrittlement, Turbine Deposits – Softening of Water – Lime Soda, Zeolite Processes – Ion Exchange Process - Reverse Osmosis – Electro Dialysis.

UNIT – II: ELECTRO CHEMISTRY

Electro Potential –Determination of single electrode potential –Standard electrode potential - Nernst Equation(problems) – Electro Chemical cell (Galvanic Cell) -Reference Electrodes-Standard Hydrogen Electrode, Calomel Electrode -- Ion Selective Electrode –Glass electrode –Determination of pH –conductometric titration- Potentiometric titrations-Batteries – Primary Cell: Dry Cell, Alkaline Battery – Secondary Cell: Lead Acid Accumulator, Lithium Ion Battery – Fuel Cells – Hydrogen – Oxygen Fuel Cell, Methanol – Oxygen Fuel Cell- solar cell - Photovoltaic Cell- Applications.

UNIT – III: CORROSION

Introduction - Theories of Corrosion(i) Dry Corrosion (Pilling Bed worth rule) (ii) Wet Corrosion – Galvanic Series – Types of Corrosion: Galvanic Corrosion, Differential Aeration Corrosion, Pitting Corrosion, Stress Corrosion – Factors Influencing Corrosion – Nature of The Metal , Nature of The Environment – Corrosion Control: Material Selection & Design –Cathodic Protection- Surface Coatings – Methods of Applications on Metals -Hot Dipping, Electroplating, Electroless Plating) – Organic Surface Coating – Paints – Their Constituents & Their Function.

UNIT – IV: FUELS

Introduction to Fuels – Classification – Solid Fuels Merits & Demerits - Calorific Value – HCV and LCV – Bomb Calorimeter - Problems Based on Calorific Values – Analysis of Coal (Proximate and Ultimate Analysis) – Numerical Problems Based on Analysis – Working of Thermal Power Station; Liquid Fuels Merits & Demerits – Petroleum – Refining – Cracking (types) –Petrol – Diesel Knocking – Octane Number, Cetane Number - Gaseous Fuels Merits & Demerits – Natural Gas – LPG, CNG.

UNIT – V: POLYMERS SCIENCES & TECHNOLOGY

POLYMERS – Introduction – Types of Polymers – Mechanism of Polymerization (Addition and Condensation) – Individual Polymers (Preparation Properties and uses of PS, PVC and Bakelite) Conducting Polymers – Biodegradable Polymers – Stereo Specific Polymers, Ziegler Natta Catalysis. PLASTIC – Types – Compounding of Plastics – Moulding (Four Types) – Fiber Reinforced Plastics - Bullet Proof Plastics – Engineering Applications.

RUBBER & ELASTOMERS: Introduction – Preparation – Vulcanization – Compounding of Rubber – Preparation, Properties and Uses of Buna-S, Buna-N and Thiokol-Engineering Applications.

UNIT – VI: ENGINEERING MATERIALS

Refractories – Ceramics (Types, Properties Applications) – Cement – Hardening and Setting- Deteriorations of cement concrete – Nanomaterials (Preparation, Properties & Applications of Carbon Nano tubes) – Definitions of Green Chemistry – Principle – Engineering Applications.

Text Books

1. Jain and Jain (Latest Edition), Engineering Chemistry, Dhanpat Rai Publishing company Ltd.
2. N. Y. S. Murthy, V. Anuradha, K Ramana Rao” A Text Book of Engineering Chemistry”, Matuthi Publications.
3. K.Sesha Maheswaramma and Mridula Chugh (2013) A Text Book of Engineering Chemistry, Pearson Publications.

Reference Books:

1. Shashi Chawal “A Text Book of Engineering Chemistry, Dhanpat Rai Publishing company Ltd,
2. S. S. Dara (2013) Text Book of Engineering Chemistry, S. Chand Technical Series.



B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
ENGINEERING MECHANICS			

UNIT – I:

SYSTEM OF FORCES: Introduction, Laws of Mechanics, Co-planar concurrent forces, Parallelogram Law, Triangle Law, Polygon Law, Free Body Diagram, Lami’s Theorem, Moment of Forces and its applications, Couples, resultant of Force systems, Components in Space.

UNIT – II:

FRICTION:

Introduction, Angle of Repose, Laws of Friction, and Friction of Bodies moving Up and Down on an Inclined Plane, Wedge Friction, Screw Jack.

UNIT – III:

CENTROID AND CENTER OF GRAVITY: Centroid of simple figures and Centroid of Composite figures. Center of Gravity of simple Bodies and Center of Gravity of Composite Bodies, Pappus Theorem.

UNIT – IV:

MOMENT OF INERTIA: Introduction, Polar Moment of Inertia, Radius of Gyration, Parallel Axis Theorem, Moment of Inertia of Composite Areas, Product of Inertia.

MASS MOMENT OF INERTIA: Introduction, Radius of Gyration, Transfer Formula for Composite Bodies.

UNIT – V:

KINETICS AND KINEMATICS:

KINETICS: Analysis as a Particle and analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

KINEMATICS: Rectilinear and Curvilinear Motion – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion.

UNIT – VI:

WORK-ENERGY METHOD:

Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

TEXT BOOKS:

1. ENGINEERING MECHANICS -A.K.TAYAL – UMESH Publications.
2. ENGINEERING MECHANICS -BASUDEB BHATTACHARYA – Oxford University Press.
3. ENGINEERING MECHANICS -A. NELSON, Mc Graw Hill Publications.

REFERENCE BOOKS:

1. ENGINEERING MECHANICS - S. Timoshenko & D.H. Young, McGraw Hill
2. ENGINEERING MECHANICS - Ferdinand L. Singer, Harper Collins Publishers
3. ENGINEERING MECHANICS - S. S. Bhavikatti, New Age Publishers.

B. TECH 2nd SEMESTER	L	P	C
	3+1	-	3
ENVIRONMENTAL STUDIES			

UNIT – I: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, Scope and Importance –Sustainability: Stockholm and Rio Summit–Global Environmental Challenges: Global warming and climate change, acid rains, ozone layer depletion.

UNIT – II: NATURAL RESOURCES: NATURAL RESOURCES AND ASSOCIATED PROBLEMS

Forest resources – Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people.

Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources

Food resources: World food problems, changes caused by non-agriculture activities-effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity

Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources.

Land resources: Land as a resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life styles.

UNIT – III: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION

Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems. Definition: genetic, species and ecosystem diversity- classification - Value of biodiversity: consumptive use, productive use, social-Biodiversity at national and local levels - India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: conservation of biodiversity.

UNIT – IV: ENVIRONMENTAL POLLUTION

Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies.

Solid Waste Management: Sources, classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products.

UNIT – V: SOCIAL ISSUES AND THE ENVIRONMENT

Population growth and explosion, effects. Urban problems related to energy -Water conservation, rain water harvesting-Resettlement and rehabilitation of people; its problems and concerns. Role of information Technology in Environment and human health. Environmental Protection Act - Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act - Forest Conservation Act – Motor Vehicle Act - Issues involved in enforcement of environmental legislation -Public awareness.

UNIT – VI: ENVIRONMENTAL MANAGEMENT

Environmental ethics - Issues and possible solutions and Environmental Education - Impact Assessment and its significance various stages of EIA, preparation of EMP and EIS, Environmental audit. Ecotourism The student should submit a report individually on any issues related to Environmental Studies course and make a power point presentation – Field work: visit to an industrial area/ecosystem area (Forest, Grassland, Desert, and Aquatic)

Text Book:

1. Environmental Studies by K. V. S. G. Murali Krishna, VGS Publishers, Vijayawada
2. A text book of Environmental Studies by C. P. Kaushik & Anubha Kaushik, New Age International Publishers.

Reference:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. A text book of Environmental Studies by Shaashi Chawla, TMH, New Delhi.

B. TECH 2nd SEMESTER	L	P	C
	-	3	2
ENGLISH COMMUNICATION SKILLS LAB – II			

Suggested Lab Manuals:

OBJECTIVE: To impart to the learner the skills of grammar as well as communication through listening, speaking, reading, and writing including soft, that is life skills.

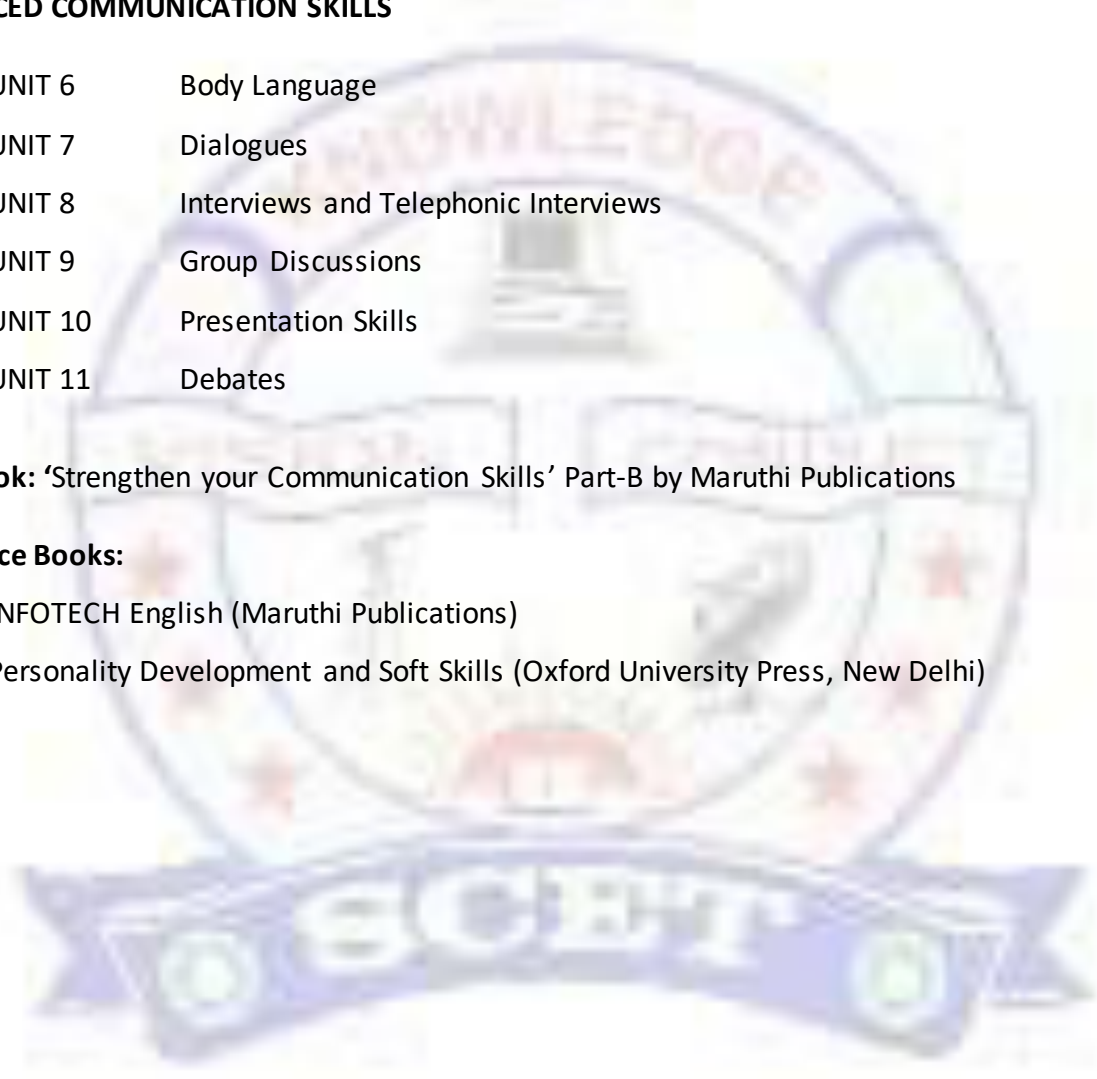
ADVANCED COMMUNICATION SKILLS

- UNIT 6 Body Language
- UNIT 7 Dialogues
- UNIT 8 Interviews and Telephonic Interviews
- UNIT 9 Group Discussions
- UNIT 10 Presentation Skills
- UNIT 11 Debates

Text Book: 'Strengthen your Communication Skills' Part-B by Maruthi Publications

Reference Books:

1. INFOTECH English (Maruthi Publications)
2. Personality Development and Soft Skills (Oxford University Press, New Delhi)



B. TECH 2nd SEMESTER	L	P	C
	-	3	2
ENGINEERING CHEMISTRY LAB			

List of Experiments

Introduction to chemistry lab

Estimation of HCl using standard Na_2CO_3

Analysis of Water

- 1 Determination of Total hardness of water
- 2 Estimation of Ferric iron
- 3 Estimation of KMnO_4 using standard $\text{H}_2\text{C}_2\text{O}_4$
- 4 Estimation of Copper (Iodometry)
- 5 Estimation of Dissolved Oxygen by Winkles Method
- 6 Determination of pH the of given water sample
- 7 Conductometric titration of strong acid Vs Strong base.
- 8 Potentiometric Titration of Strong Acid Vs Strong Base
- 9 Preparation of Phenol-Formaldehyde Resin

Estimation of properties of Oil

- 10 Acid Number
- 11 Saponification value

Student has to do Any Ten Experiments of the Following

MANUAL:

1. Engineering Chemistry Lab Manual Prepared by Chemistry Faculty.

B. TECH 2nd SEMESTER	L	P	C
	-	3	2
ENGINEERING WORK SHOP PRACTICE			

COURSE OBJECTIVE: To impart hands – on practice on basic engineering trades and skills.

NOTE: At least two exercises to be done from each trade.

TRADE;

CARPENTRY;

1. CROSS LAP JOINT
2. DOVE-TAIL JOINT
3. MORTISE AND TENNON JOINT

FITTING:

1. SQUARE FIT
2. V-FIT
3. HALF ROUND FIT

FORGING:

1. ROUND ROD TO SQUARE
2. S-HOOK
3. ROUND ROD TO SQUARE HEADED BOLT

HOUSE WIRING:

1. PARALLEL/SERIES CONNECTION OF THREE BULBS
2. STAIR CASE WIRING
3. FLOURESCENT LAMP FITTING

SHHET METAL:

1. SQUARE TRAY
2. HOLLOW CYLINDER
3. OPEN SCOOP

MANUAL:

1. Engineering Work Shop Practice Lab Manual Prepared by Mechanical Faculty.